Lesson 3.5 Obj: To raise powers to powers.

(0-15) Do Now: Create own exponential expressions and swap (from Add On Lesson #2)

(15-30) Notes: Investigation 5: Powers to Powers; Products of Powers to Powers

Factors	**Expansion**	**Answer as Power**
$(2^2)^2$	$(2^2)(2^2) = 2(2)(2)(2)$	2^4
$(2^2)^3$	$(2^2)(2^2)(2^2) = (2)(2)(2)(2)(2)(2)$	2^6
$(2^3)^2$	$(2^3)(2^3) = (2)(2)(2)(2)(2)(2)$	2^6
$(x^5)^2$	$(x^5)(x^5)$ *** use multiplication rule to add	x^{10}
$(2x^2)^2$	$(2x^2)(2x^2) = 2(2)(x^2)(x^2) = 2(2)(x)(x)(x)(x)$	$4x^4$
$(x^2y^3)^3$	$(x^2y^3)(x^2y^3)(x^2y^3)$ **use mult. rule	x^6y^3

Property: Raising Powers to Powers:
For every nonzero number a and integers m and n, $(a^m)^n = a^{mm}$.

Property: Raising Power Products to Powers: For every nonzero numbers a and b and integers m and n, $(a^mb^m)^n = a^{mn}b^{mn}$.

When in doubt, expand it out!

Ex 1: ($b^4)^8 = b^{32}$ **Ex 2:** $t^2(t^7)^{-2}$ ***Follow GEMDAS:*** $t^2(t^{-14}) = t^{-12} = \frac{1}{t^{12}}$

Ex 3: $(3x^2y^4z)^2$ **=** $9x^4y^8z^2$

(30-45) Extended Exit Slip (from Add On Lesson)

Name: _____ Obj : _____
Teacher: _____ _____
Algebra Pd:_____ _____

_____ _____ _____
Day Month Year

Notes: Investigation: _____

Factors	**Expansion**	**Answer as Power**

Property: Raising Powers to Powers:
Property: Raising Products to Powers:
When in doubt, expand it out!

Examples:
